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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,375	01/09/2007	Naoki Shirakawa	294205US2PCT	8315

22850 7590 06/11/2010

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
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EXAMINER	
PETTITT, JOHN F	

ART UNIT	PAPER NUMBER
3744	

NOTIFICATION DATE	DELIVERY MODE
06/11/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/587,375	SHIRAKAWA, NAOKI	
	Examiner	Art Unit	
	John F. Pettitt	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawa et al. (US 2003/0122543) hereafter Shirakawa in view of Hariharan et al. (WO 2004/079340) hereafter Hariharan. Shirakawa teaches a helium-3 refrigerator (20) utilizing a magnetic property measurement system (1) comprising: a helium-3 refrigerator (20) provided with a sample rod (5) having a sample (parag. 12) fixed thereon and a main pipe (23, 29) having the sample rod (5) inserted therein and forming in a circumference of the sample rod (5) a space for effecting cooling with helium-3 (parag. 12) and a magnetic property measurement system (1) provided with a tubular body (8) for permitting insertion of the helium-3 refrigerator (20) therein and a cooling means (2, 6) disposed on an outer periphery of the tubular body (8) and operated with

helium-4 (parag. 32) and further provided with a superconducting magnet (3a, parag. 31, 37), a magnetic field forming means (parag. 53, 54), a temperature adjusting means (54) and a magnetic field adjusting means (52).

Shirakawa does not explicitly teach that the main pipe is formed, sequentially from top to bottom, of an upper supporting tube, a condensing tube, a lower inner tube and an outer tube adapted to form an insulated vacuum chamber between the outer tube and the lower inner tube and wherein the lower inner tube is formed of titanium. However, there are a wide variety of samples that would be desirably tested on the sample rod with differing temperatures and magnetic fields. Further, many testing applications would benefit from a probe that allowed fine movement of the sample during such testing. Hariharan teaches a test probe (18) that provides fine movement (page 6, parag. 5; page 5, parag. 4) for testing samples at various temperatures and magnetic fields (page 3, parag. 5-6, page 5, parag. 2). Further, Hariharan teaches a main tube formed from top to bottom of an upper supporting tube (30), a condensing tube (top section of 22; see Fig. 3 - 22 from top down to either 38a or step near 46), a lower inner tube (44) and an outer tube (lower section of 22 from step near 46 or 38a down through 54) adapted to form an insulated vacuum chamber (inside 20; page 17, parag 3, and sample chamber - page 5, parag.3) between the outer tube (lower section of 22) and the lower inner tube (44), and wherein the upper supporting tube (30) and the lower inner tube (44) are connected to each other through the condensing tube (interpreted as there is a connection between the upper and lower tube and that connection includes the condensing tube; 30 is connected to 44 and that connection

includes the upper section of 22), and wherein the lower inner tube (44) is formed of titanium (page 14, parag. 2). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the helium cooled probe (23, 29) and sample rod (5) of Shirakawa with the probe means of Hariharan for the purpose of providing a more flexible test probe, capable of moving the sample during testing. Thus the main pipe would comprise an upper supporting tube (30) of stainless steel (page 12, parag. 3), a condensing tube (top section of 22) and an outer tube (lower section of 22) of copper (page 14, parag. 3; page 13, parag. 2). In regard to claim 7, Hariharan teaches that the outer tube (lower section of 22) and the lower inner tube (44) are connected to each other via a lower part (38, 38a or part of 22 near 38a) of the condensing tube (upper section of 22) with a certain gap (between lower section 22 and 44). In regard to claim 8, Hariharan teaches a connecting tube (38a) is mounted on an underside of the condensing tube (upper section of 22) and the outer tube (lower section of 22) and the lower inner tube (44) are connected to each other via the connecting tube (38a) with a certain gap (between lower section of 22 and 44).

Claims 1-8 are alternatively rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawa in view of Hariharan.

In regard to claims 1-3, Shirakawa teaches a helium-3 refrigerator (20) utilizing a magnetic property measurement system (1) comprising: a helium-3 refrigerator (20) provided with a sample rod (5) having a sample (parag. 12) fixed thereon and a main pipe (23, 29) having the sample rod (5) inserted therein and forming in a circumference

of the sample rod (5) a space for effecting cooling with helium-3 (parag. 12) and a magnetic property measurement system (1) provided with a tubular body (8) for permitting insertion of the helium-3 refrigerator (20) therein and a cooling means (2, 6) disposed on an outer periphery of the tubular body (8) and operated with helium-4 (parag. 32) and further provided with a superconducting magnet (3a, parag. 31, 37), a magnetic field forming means (parag. 53, 54), a temperature adjusting means (54) and a magnetic field adjusting means (52).

Shirakawa does not explicitly teach that the main pipe is formed, sequentially from top to bottom, of an upper supporting tube, a condensing tube, a lower inner tube and an outer tube adapted to form an insulated vacuum chamber between the outer tube and the lower inner tube and wherein the lower inner tube is formed of titanium. However, there are a wide variety of samples that would be desirably tested on the sample rod with differing temperatures and magnetic fields. Further, many testing applications would benefit from a probe that allowed fine movement of the sample during such testing. Hariharan teaches a test probe (18) that provides fine movement (page 6, parag. 5; page 5, parag. 4) for testing samples at various temperatures and magnetic fields (page 3, parag. 5-6, page 5, parag. 2). Further, Hariharan teaches a main tube formed from top to bottom of an upper supporting tube (20), a condensing tube (top section of 22; see Fig. 3 - 22 from top down to either 38a or step near 46), a lower inner tube (44) and an outer tube (lower section of 22 from step near 46 or 38a down through 54) adapted to form an insulated vacuum chamber (inside 20 and sample chamber; page 17, parag 3, page 5, parag.3) between the outer tube (lower section of

22) and the lower inner tube (44, and wherein the upper supporting tube (20) and the lower inner tube (44) are connected to each other through the condensing tube (interpreted as there is a connection between the upper and lower tube and that connection includes the condensing tube; 20 is connected to 44 and that connection includes the upper section of 22), and wherein the lower inner tube (44) is formed of titanium (page 14, parag. 2).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the helium cooled probe (23, 29) and sample rod (5) of Shirakawa with the control means of Hariharan for the purpose of providing a more flexible test probe, capable of moving the sample during testing. Thus the main pipe would comprise a condensing tube (top section of 22) and an outer tube (lower section of 22) of copper (page 14, parag. 3; page 13, parag. 2).

In regard to claims 4-6, Hariharan does not explicitly teach that the upper supporting tube (20) is stainless steel, however, it is well known to form cryogenic components from stainless steel and further, Hariharan suggests that the tube (20) be a material of low thermal conductivity (page 11, parag. 4). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify Shirakawa and Hariharan with a stainless steel tube (20) for the purpose of providing a support tube that was strong and less conductive.

In regard to claim 7, Hariharan teaches that the outer tube (lower section of 22) and the lower inner tube (44) are connected to each other via a lower part of the condensing tube (20) with a certain gap (between lower section 22 and 44). In regard

to claim 8, Hariharan teaches a connecting tube (38a, or upper section of 22) is mounted on an underside of the condensing tube (20) and the outer tube (lower section of 22) and the lower inner tube (44) are connected to each other via the connecting tube (38a) with a certain gap (between lower section of 22 and 44).

Claims 1-8 are alternatively rejected under 35 U.S.C. 103(a) as being unpatentable over Shirakawa in view of Hariharan.

In regard to claims 1-3, Shirakawa teaches a helium-3 refrigerator (20) utilizing a magnetic property measurement system (1) comprising: a helium-3 refrigerator (20) provided with a sample rod (5) having a sample (parag. 12) fixed thereon and a main pipe (23, 29) having the sample rod (5) inserted therein and forming in a circumference of the sample rod (5) a space for effecting cooling with helium-3 (parag. 12) and a magnetic property measurement system (1) provided with a tubular body (8) for permitting insertion of the helium-3 refrigerator (20) therein and a cooling means (2, 6) disposed on an outer periphery of the tubular body (8) and operated with helium-4 (parag. 32) and further provided with a superconducting magnet (3a, parag. 31, 37), a magnetic field forming means (parag. 53, 54), a temperature adjusting means (54) and a magnetic field adjusting means (52).

Shirakawa does not explicitly teach that the main pipe is formed, sequentially from top to bottom, of an upper supporting tube, a condensing tube, a lower inner tube and an outer tube adapted to form an insulated vacuum chamber between the outer tube and the lower inner tube and wherein the lower inner tube is formed of titanium.

However, there are a wide variety of samples that would be desirably tested on the sample rod with differing temperatures and magnetic fields. Further, many testing applications would benefit from a probe that allowed fine movement of the sample during such testing. Hariharan teaches a test probe (18) that provides fine movement (page 6, parag. 5; page 5, parag. 4) for testing samples at various temperatures and magnetic fields (page 3, parag. 5-6, page 5, parag. 2). Further, Hariharan teaches a main tube formed from top to bottom of an upper supporting tube (20), a condensing tube (top section of 22; see Fig. 3 - 22 from top down to either 38a or step near 46), a lower inner tube (44) and an outer tube (lower section of 22 from step near 46 or 38a down through 54) adapted to form an insulated vacuum chamber (inside 20; page 17, parag 3, and sample chamber - page 5, parag.3) between the outer tube (lower section of 22) and the lower inner tube (44, and wherein the upper supporting tube (20) and the lower inner tube (44) are connected to each other through the condensing tube (interpreted as there is a connection between the upper and lower tube and that connection includes the condensing tube; 20 is connected to 44 and that connection includes the upper section of 22), and wherein the lower inner tube (44) is formed of titanium (page 14, parag. 2).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the helium cooled probe (23, 29) and sample rod (5) of Shirakawa with the control means of Hariharan for the purpose of providing a more flexible test probe, capable of moving the sample during testing. Thus the main

pipe would comprise a condensing tube (top section of 22) and an outer tube (lower section of 22) of copper (page 14, parag. 3; page 13, parag. 2).

Further, assuming arguendo that a vacuum is not present inside chamber (20 and sample chamber). It is noted that Hariharan teaches that the sample chamber is vacuum insulated and further than the proximate end of the probe contains a vacuum with housing (24). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to form the sample chamber on the distal end of the probe (18) to maintain a vacuum throughout the probe (18) for the purpose of allowing the entire probe to be vacuum insulated thereby reducing heat leak and for the purpose of allowing the vacuum in the sample chamber to be drawn through convenient fittings at the top of the probe (18).

In regard to claims 4-6, Hariharan does not explicitly teach that the upper supporting tube (20) is stainless steel, however, it is well known to form cryogenic components from stainless steel and further, Hariharan suggests that the tube (20) be a material of low thermal conductivity (page 11, parag. 4). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify Shirakawa and Hariharan with a stainless steel tube (20) for the purpose of providing a support tube that was strong and less conductive.

In regard to claim 7, Hariharan teaches that the outer tube (lower section of 22) and the lower inner tube (44) are connected to each other via a lower part of the condensing tube (20) with a certain gap (between lower section 22 and 44). In regard to claim 8, Hariharan teaches a connecting tube (38a, or upper section of 22) is

mounted on an underside of the condensing tube (20) and the outer tube (lower section of 22) and the lower inner tube (44) are connected to each other via the connecting tube (38a) with a certain gap (between lower section of 22 and 44).

Response to Arguments

Applicant's arguments filed 3/4/2010 have been fully considered but they are not persuasive.

1. Applicant's arguments (page 8, ¶ 2) are an allegation that Shirakawa does not teach the claimed helium cooling. In response to the applicant's arguments, the examiner disagrees and notes that Shirakawa explicitly teaches helium cooling (parag. 36 - via vaporized helium). Therefore the allegation is unpersuasive and the rejection remains.

2. Applicant's arguments (page 9-11) are that Hariharan does not teach the newly amended limitations concerning the tubes. In response to the applicant's arguments, the examiner fully disagrees and directs the applicant to the detailed rejection above. In regard to the applicant's allegation that vacuum insulation is not present, it is noted that both Hariharan and Shairakawa teach that the distal or bottom end of the probe is vacuum insulated (Shirakawa - 29; parag. 35; Hariharan - page 10, parag. 2 - sample chamber has vacuum). Hariharan is relied on explicitly and teaches that the probe (18) houses the sample (page 11, parag 3) and that the sample chamber is sealed, while having an access (page 10, parag. 1). Therefore, the access in no way diminishes the teachings of a vacuum within the probe (18) and the allegation is unpersuasive.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John F. Pettitt whose telephone number is 571-272-0771. The examiner can normally be reached on M-F 8a-4p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler or Frantz Jules can be reached on 571-272-4834 or 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John F Pettitt /
Examiner, Art Unit 3744

/Cheryl J. Tyler/
Supervisory Patent Examiner, Art Unit 3744

JFP III
June 2, 2010